ESI 6417
Linear Programming and Network Optimization
Spring 2015

Instructor: Dr. Guanghui (George) Lan

Time: Tuesday period 3 (9:35-10:25am), Tuesday period 4 (10:40-11:30am); Thursday period 3 (9:35-10:25am), Thursday period 4 will be used if necessary

Location: WEIM 1092

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TA: Yi Zhou, yizhou@ufl.edu

TA Office Hours: T 1:00-2:00pm

Overview and Objectives

This course is designed for **Ph.D. students** majoring in Industrial and System Engineering. After taking this course, the students are expected to have fundamental understanding about linear optimization models, theory and algorithms, as well as their extensions to network flow problems.

Textbooks

- *Introduction to Linear Optimization*, Bertsimas and Tsitsiklis, 1997 (Required).
- *Lecture Notes on Introduction to Linear Optimization*, Nemirovski, http://www2.isye.gatech.edu/nemirovs/OPTI_LectureNotes.pdf (Recommended).

Pre-requisite

A theoretical course in linear algebra, e.g., one that requires students to do mathematical proofs on assignments and during exams.

Grading

- Midterm: Thurs., February 26 (9:35 am - 11:05 am), 35%
- Final: Thurs., April 29 (5:30 pm - 7:30 pm), 35%
- Homework and quizzes, 30%

Policy

- Every student is expected to follow the University of Florida Honor Code. (See www.dso.ufl.edu/STG/default.html.)
- Weekly assignments, solutions, and others will be posted on Sakai. Students should check Sakai regularly, particular on Tuesday and Thursday morning.
- **Quizzes will not be announced in advance.**

Course Outline

Totally 15 weeks, 8 weeks before the midterm exam and 7 afterwards.

1. LP models and terminology (1 week)
2. Polyhedral theory ($1-2$ weeks)
3. Simplex method (2 weeks)
4. Duality theory ($2-3$ weeks)
5. Sensitivity analysis ($1-2$ week)
6. Network flow problems ($2-3$ weeks)
7. Advanced topics (e.g., complexity theory and interior point methods) ($2-3$ week)